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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/509,859	11/08/2004	Masato Murara	NIS-15723	4320
40854	7590	09/12/2005	EXAMINER	
RANKIN, HILL, PORTER & CLARK LLP 4080 ERIE STREET WILLOUGHBY, OH 44094-7836			HIRUY, ELIAS	
			ART UNIT	PAPER NUMBER
			2837	

DATE MAILED: 09/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/509,859

Applicant(s)

MURARA ET AL.

Examiner

Elias B. Hiruy

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 05 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 October 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 621,281,05
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

**Priority**

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

**Information Disclosure Statement**

2. An initialed and dated copy of Applicant's IDS form 1449 is attached to the instant Office action.

**Claim Rejections - 35 USC § 102**

- The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claim 1 is rejected under 35 U.S.C. 102(e) as being clearly anticipated by Yoshimura (US 6,603,277).

Yoshimura discloses an apparatus that drives a brushless direct current motor/cooling fan.

**Regarding claim 1**, the patent discloses a rotor (3r, figure 1) having a plurality of blades (2, figure 1). The stator (3, figure 1) of the disclosure has excitation windings (3U, 3V, 3W, figure 1) that are excited to rotate the rotor. The drive circuit (12, figure 1)

is arranged at the stator side for supplying excitation current to the excitation windings according to a speed control command (column 3, lines 44-65). Further, the disclosure shows a speed control command generating means (IC 13, figure 1), arranged at the stator side, for executing operation according to an input signal (column 4, lines 1-3) and generating the speed control command (column 5 lines 18-22). The speed control command generating means (13) is a microcomputer (column 5, lines 47-51) that is operable to communicate with the external equipment (9 ECU, figure 1).

**Claim Rejections - 35 USC § 103**

- The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
- The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:
  1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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4. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshimura (US 6,603,277) as applied to claim 1 above, and further in view of Murty et al (US 5,291,106; referred as Murty from here on).

In paragraph 3 above, it is shown how the limitations of claim 1 were met by Yoshimura disclosure.

**In regards to claim 2**, Yoshimura et al shows a speed detector for detecting a rotational speed of the rotor. The disclosure further shows how the drive circuit is constructed so as to supply the excitation current to the excitation current windings under pulse width modulation control (column 6, lines 5-15). The microcomputer of Yoshimura further operates the speed control command based on control conditions transmitted from the external equipment and signal indicating the rotation speed detected by the speed detector (column 6, lines 5-15).

However, Yoshimura fails to show a current detector for detecting an excitation current flowing through the excitation windings. Yoshimura invention also fails to show how the microcomputer further uses the information obtained from the current detector.

Murty, on the other hand, shows a control method for a DC-Fed electric motor. In the invention, it is disclosed how the system controller of Murty et al uses the current sensed (signal Ifb and device 44, figure 1) and/or the speed sensed from the speed detector is used to control the motor (column 4, lines 59-68; column 4, lines 34-50).

Accordingly, it would have been obvious for one skilled in the art at the time the invention was made to incorporate the method of detecting the drive current of Yoshimura apparatus by implement the method as shown in Murty. The motivation

being that detecting the excitation current flowing through the excitation windings enables one to develop a correctional signal earlier if it is determined the winding current exceeds a given error.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshimura (US 6,603,277) as applied to claim 1 above, and further in view of Mays, II (US 6,392,372; referred as Mays from here on).

**Regarding claim 3**, although Yoshimura shows a communication between the ECU (i.e. external equipment) and the microcomputer, Yoshimura fails to clearly show if the communication is a bi-directional communication.

Mays, on the other hand, shows an apparatus that has a bidirectional communication between the commutation control and an external equipment via the serial communication interface device based on a predetermined protocol (column 7, lines 25-44; column 11, lines 3-11).

Accordingly, it would have been obvious for one skilled in the art at the time the invention was made to incorporate the method of serial communication for a bidirectional communication into Yoshimura apparatus by implementing the method as shown in Mays. The motivation being that having the capability of bi-directional communication will enable for an efficient control of the system as one would have enough information on the status of the motor and the system over all at all times.

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshimura (US 6,603,277) as applied to claim 1 above, and further in view of Nordby et al (US 5,736,823; referred as Nordby from here on).

**Regarding claim 4**, although Yoshimura shows a how the airflow could be realized to regenerate electric power, Yoshimura fails to clearly show how the airflow volume-static pressure characteristic can be improved by the microcomputer.

Nordby, on the other hand, shows a processor that utilizes different parameters to control the speed of the motor in order to attain a desired airflow rate (i.e. airflow volume-static pressure characteristic) (column 3, lines 50-68).

Accordingly, it would have been obvious for one skilled in the art at the time the invention was made to incorporate the function of adjusting the motor speed to control the air flow rate based on different parameters as taught by Nordby into Yoshimura apparatus. The motivation being that having the capability of adjusting the motor speed to attain a desired airflow rate by the processor enhances the performance of the system/apparatus.

7. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshimura (US 6,603,277) as applied to claim 1 above, and further in view of Hayashida (US 5,736,823).

**Regarding claim 5**, Yoshimura fails to clearly show how the speed control command generating means is constructed so that the pulse width modulation control frequency of the drive circuit is set higher when the rotator rotates at low speed than at high speed.

However, Hayashida teaches several ways of controlling an inverter and the apparatus thereof wherein one of the embodiment consist increasing the frequency of

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the PWM rate at low speed and reducing the frequency of the PWM rate at higher speed (column 7, lines 16-21).

Accordingly, it would have been obvious for one skilled in the art at the time the invention was made to incorporate the method of Hayashida into Yoshimura apparatus and controlling the frequency of the PWM rate to be a higher value at low speed and lower value at higher speed. The motivation being that the method enables one to reducing the total switching device-generated heat from increasing.

Barring a showing of criticality, the limitation of claim 6, which presents the switching frequency of 1Khz at higher speed and 16Khz at low speed is given little patentability weight. The prosecution in this office action will proceed by considering the particular frequencies disclosed as no more than an optimum or workable range. Since it has been held where the general conditions of a claim are disclosed in the prior art, discovering an optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

**In regards to claim 6 limitations**, the aforementioned invention of Yoshimura as modified by Hayashida shows that the frequency of the PWM rate is between 10-20Khz at low speed that consists the limitation of 16Khz at low speed; in addition, when the motor speed becomes higher the switching frequency decreases to a lower value of 3Khz (column 7 lines 1-8). In view of the above case and the limitations present in the aforementioned invention, the claim limitation of claim 6 is fully met.



8. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshimura (US 6,603,277) in view of Murty et al (US 5,291,106) as applied to claim 2 above, and further in view of Mays, II (US 6,392,372; referred as Mays from here on).

**Regarding claim 7**, although the aforementioned invention of claim 2 as discussed in paragraph 4 shows a communication between the external equipment and the microcomputer, the aforementioned invention fails to clearly show if the communication is a bi-directional communication.

Mays, on the other hand, shows an apparatus that has a bidirectional communication between the commutation control and an external equipment via the serial communication interface device based on a predetermined protocol (column 7, lines 25-44; column 11, lines 3-11).

Accordingly, it would have been obvious for one skilled in the art at the time the invention was made to incorporate the method of serial communication for a bidirectional communication into the aforementioned invention by implementing the method as shown in Mays. The motivation being that having the capability of bi-directional communication will enable for an efficient control of the system as one would have enough information on the status of the motor and the system over all at all times.

### **Conclusion**

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. For additional arts cited, refer to the attached PTO-892 form.

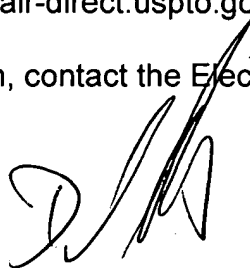
**Remarks**

10. No claim is allowed.
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**Correspondence**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elias B. Hiruy whose telephone number is 571-272-6105. The examiner can normally be reached on 7:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Martin can be reached on (571) 272-2107. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



EH

09/05/05

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